

H. S. + John.

# Rhodora

JOURNAL OF THE  
NEW ENGLAND BOTANICAL CLUB

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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF  
HARVARD UNIVERSITY—NO. XCI

THE FLORA OF THE ELIZABETH ISLANDS,  
MASSACHUSETTS

JOHN M. FOGG, JR.

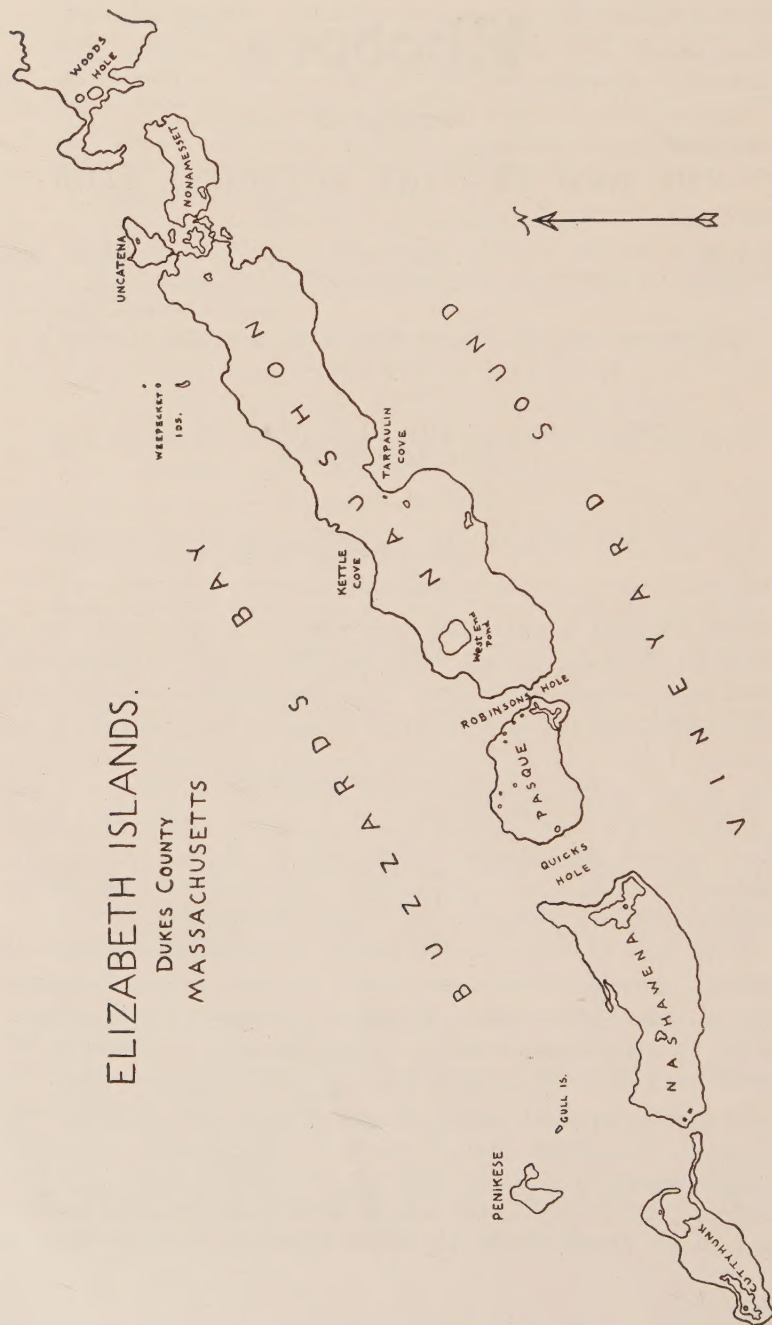
PART I. GENERAL DISCUSSION

LOCATION

THE Elizabeth Islands are formed by a partly submerged ridge of morainal hills which extends WSW from Woods Hole, Massachusetts, for a distance of about 16 miles. This ridge has been separated from the mainland, as well as divided into islands, in comparatively recent geological time. To the northwest this chain of islands is washed by the waters of Buzzards Bay, while along their southeastern and southern shores runs Vineyard Sound, a channel 4 miles wide which flows between the Elizabeth Islands and Martha's Vineyard. Together, the Elizabeths and Martha's Vineyard constitute Dukes County, the former being included in Gosnold Township.

Seven main islands and twelve smaller ones make up the Elizabeth Islands. Starting at their eastern end the seven principal divisions are, in order: Nonamesset, Uncatena, Naushon, Pasque, Nashawena, Cuttyhunk and Penikese. All of these lie in a more or less direct line with the exception of Penikese, which is separated from the main axis of the chain, being just one mile due north of Cuttyhunk. Between Nonamesset and Naushon lie Monohansett and Buck Islands, separated by narrow channels or "gutters" which have been bridged. To the north, and lying in Hadley Harbor, are Captain's and Ram's Head Islands, the latter appearing on some maps as





Puritan Island. To the south of the gutters lie East Buck and West Buck Islands, although here again confusion exists, as West Buck occasionally appears on maps as "Monohansett." The three Weepecket Islands extend northward from the eastern end of Naushon and now constitute a bird sanctuary. With the mention of Gull Island, a small strip of sand lying east of Penikese, and Pine Island, immediately to the northeast of Nonamesset, the subject of the minor islands may be dismissed, for the remaining islets are too small to have received formal names.

#### HISTORICAL INTEREST OF THE ELIZABETH ISLANDS

A unique historical interest attaches to the Elizabeth Islands through the fact that upon the outermost of the chain was made the first attempt to establish an English settlement in North America. On the 4th of June (Old Style, May 25th), 1602, Captain Bartholomew Gosnold, after having named Cape Cod and Dover Cliff (now Gay Head), fixed upon the island of Cuttyhunk as the site of a future settlement and, in honor of his sovereign queen, called it Elizabeth's Isle, which name has since been applied to the entire group. Here, upon a tiny islet in a large pond at the west end, the crew of Gosnold's ship, the "Concord," constructed a rude fort, and here they lived for a period of three weeks. This settlement, short-lived though it was, thus antedates the founding of Jamestown by five years and that of Plymouth by eighteen years, a fact which was commemorated by the erection and dedication of a monument to Gosnold on Cuttyhunk upon the occasion of the tercentenary of the original landfall.<sup>1</sup>

Cuttyhunk is the only member of the Elizabeth Islands which has been able to boast a permanent population. The little town of Gosnold, named after its illustrious founder, has long existed as a fishing village at the east end of the island and today has about one hundred inhabitants. During the whaling days schooners bound for New Bedford were accustomed to stop at Cuttyhunk to pick up their pilots.

Another claim to fame on the part of one of the Elizabeth Islands may be made for Penikese, the smallest and most desolate member of the chain. Here, in the summer of 1873, Louis Agassiz founded his school which, through the generosity of the New York merchant who

<sup>1</sup> For further details concerning the history of Gosnold on Cuttyhunk and the exercises which marked the dedication of the monument in 1903, see the *Old Dartmouth Historical Sketches*, nos. 1 and 4. New Bedford, Mass. (1903).

donated the island and funds for the construction of a laboratory, became known as the Anderson School of Natural History. To this summer school, the first of its kind in the country, came students from all over the United States and the roll included names which later became known as belonging to some of the foremost figures in American biology. Following Agassiz's death in December, 1873, the school was continued for one summer by his son Alexander, but thereafter was abandoned and the island reverted to the State of Massachusetts, later to be used as a leper colony, from which function it was released only in 1921.

The island of Naushon has for several generations been the property of the Forbes family, various members of which have summer homes at the east end, near Hadley Harbor. To the Forbeses also belong Nonamesset, Uncatena and Nashawena and it is only through the generosity and hospitality of the owners that it has been possible to carry on the botanical exploration which forms the basis for the present survey.

#### PREVIOUS BOTANICAL WORK ON THE ELIZABETH ISLANDS

Mention has been made above of Gosnold's visit to the Elizabeth Islands in 1602. With Gosnold on that expedition were Gilbert Archer and John Breton, "gentlemen and historians." The former has left us a very readable and illuminating account of the voyage.

One of the chief objects which Gosnold had in visiting the New World was to collect and carry home to England a cargo of native Sassafras which was then much in demand because of its supposed medicinal value. According to Archer, Elizabeth's Isle (Cuttyhunk) was in 1602 overgrown with wood, a fact not without interest in view of the present treeless nature of this and of several other islands of the chain. Not only did Gosnold's party find there the Sassafras which they sought, but mention is also made of cedar, oak, beech and ash. The very islet upon which the fort was built is spoken of as cedar-covered. Hills Hope (Penikese) was likewise overgrown with cedar, and Naushon which was also visited is referred to as being forested, a character which this island, almost alone of the Elizabeths, has retained in large measure down to the present day.

References to the plant life of the Elizabeth Islands seem to be lacking for a period of more than 250 years, but we may well suppose that during that interval extensive deforestation was carried on and



the islands divested of their original tree growth. Certain it is that within the memory of no living inhabitant have there been trees on Cuttyhunk or Penikese, except the few which have been planted by the hand of man. It is probable that this statement also holds for Pasque and the greater part of Nonamesset and Uncatena. Nashawena still has considerable areas which are more or less wooded, and Naushton, as already mentioned, has apparently retained much of its original forest.

The first published report, known to the writer, on the flora of any of the Elizabeth Islands dates from the year 1874 and concerns the island of Penikese. Among the students attracted to Agassiz's laboratory in the summer of 1873 was David Starr Jordan, who began his scientific career with a botanical publication. The task assigned to Jordan by Agassiz was an enumeration of the plants growing upon the island and in the waters surrounding it. As the result of this study Jordan published a list<sup>1</sup> of the flora in which he included not only flowering plants but cryptogams as well. So far as the lower forms were concerned, since no attempt was made at microscopic examination, only the most obvious species were included. The list enumerates 83 species of algae, 2 mosses, 1 fern and 113 species of flowering plants. Although the marine algae were preserved and the original set is still in existence, the writer has it on the authority of Dr. Jordan that no collection of specimens of the higher plants was made, and we have therefore only the published names as records. In 1923, on the occasion of the fiftieth anniversary of the founding of the Anderson School, a botanical survey of Penikese was made by the staff and students of the Marine Biological Laboratory at Woods Hole, Massachusetts. The results of this survey were published in *RHODORA* for 1924, and, insofar as they indicate the possible direction of change in the elements of the flora of one of the Elizabeth Islands, will be referred to later.

Since 1873 nearly a score of botanists have visited the Elizabeth Islands and brought back specimens which are in one or more of our eastern herbaria. Since these records have been incorporated into the catalog which forms the second part of this study, a brief chronological account of these collectors is here presented.

Walter and C. E. Faxon, in 1873 and 1875 respectively, collected a few specimens on Nashawena; these sheets are in the Gray Herbarium.

<sup>1</sup> Jordan, D. S. "The Flora of Penikese." *Am. Nat.* viii. 193 (1874).

In 1890 a Miss Weir collected on Naushon a few sheets which are now in the herbarium of the New England Botanical Club.

In August, 1898, Dr. Arthur Hollick made a trip to the islands with a view to studying the geological formations there presented. In the published account of this survey<sup>1</sup> the author makes mention of some of the plants which he found growing on the various members of the chain. The few specimens which he collected are in the New York Botanical Garden herbarium.

In the herbarium of the Marine Biological Laboratory at Woods Hole are several plants collected on Naushon in 1901. Some of these bear the name of S. B. Sipe while the others are merely signed "E. A. S." Inquiry has shown that these initials refer to Miss Elizabeth A. Simons (now Mrs. Eldred Jungerich).

Also from 1901 there dates the largest collection made on any of the Elizabeths, previous to that which forms the basis of the present report. In the Library of the Gray Herbarium there is a manuscript list compiled by Mrs. Alice R. Northrop of the plants of Nashawena. This list contains the names of 335 species of flowering plants and ferns and therefore constitutes a substantial contribution to our knowledge of the flora of this island. Mrs. Northrop spent the summer of 1901 and a part of that of 1903 on Nashawena and was thus admirably situated for making careful botanical observations. Her list includes many surprises: species which are either absent or very locally known from southeastern Massachusetts, some of them constituting, indeed, notable extensions in range. To this class of rarities belong such plants as *Cyperus erythrorhizos*, *Uvularia perfoliata*, *Habenaria bracteata*, *Arethusa bulbosa*, *Rumex verticillatus*, *Coptis groenlandica*, *Ranunculus reptans* and *Hydrocotyle Canbyi*. Unfortunately not a single one of these specialties appears to be corroborated by herbarium material. However, Mrs. Northrop did collect some specimens for permanent record, about one-fifth of the names on her list being represented by sheets in the collections of the New York Botanical Garden. And the fact that a few of her most interesting records, such as *Habenaria blephariglottis*, *Liparis (Leptorchis) Loeselii*, *Tipularia discolor* and *Asclepias verticillata* are substantiated by specimens and that others, such as *Arisaema triphyllum*, *Medeola virginiana*, *Ranunculus delphinifolius*, *Myriophyllum pinnatum*,

<sup>1</sup>Hollick, A. A Reconnaissance of the Elizabeth Islands. Cont. Geol. Dept. Columbia Univ. xi. no. 72 (1901).



*Hydrocotyle Canbyi*, *Cornus florida* and *Trientalis borealis*, have been duplicated by the writer either for Nashawena or other islands of the group, makes it necessary to give definite weight to the plants mentioned on Mrs. Northrop's list.

In the herbarium of the New England Botanical Club is a sheet of *Habenaria orbiculata* collected on Naushon by Lillian MacRae in July, 1904. This is the only specimen bearing the name of this collector seen by the writer.

A. H. Moore also visited the Elizabeth Islands in 1904 and several sheets of his collecting from Naushon and Penikese are in the collections of the New England Botanical Club.

In 1906, J. A. Cushman paid two visits to the islands, collecting on Nonamesset on July 27, and on Naushon, in company with Max Morse, on August 25. Specimens from these trips are in the herbarium of the Boston Society of Natural History.

Naushon and Nashawena were visited by E. F. Williams on July 10, 1911. The few plants collected on this occasion are in the New England Botanical Club herbarium.

In 1911, also, F. W. Pennell made several collecting trips to the Elizabeths, touching chiefly Nonamesset, Naushon, Nashawena and Cuttyhunk. Dr. Pennell's specimens, numbering about fifty, were distributed to the Marine Biological Laboratory and the University of Pennsylvania.

Thirty sheets from Cuttyhunk, collected by S. N. F. Sanford in 1917, are now in the New England Botanical Club.

Scattered collections were made on various islands by W. R. Taylor from 1917 to 1921. These specimens, with the exception of a sheet of *Liparis Loeselii* which is now in the New England Club, are either at the Marine Biological Laboratory or at the University of Pennsylvania.

Dr. H. K. Svenson visited Pasque on September 8, 1926 and collected a few specimens which are now in the herbarium of the New England Botanical Club.

On August 10, 1927, Professor M. L. Fernald and the writer visited Uncatena and Naushon, and the material collected upon that occasion has been distributed to the New England Botanical Club and the University of Pennsylvania.

A few specimens were collected by E. W. Hervey on Cuttyhunk. These bear no date and are now in the New England Botanical Club herbarium.

## COLLECTIONS MADE DURING COURSE OF PRESENT STUDY

By far the largest number of records accumulated to form the basis for the present account of the flora of the Elizabeth Islands represent collections made by the writer over a period of six years. From 1923 to 1928 inclusive, each island was visited many times and hundreds of specimens were collected. This material has been worked over and specimens have been distributed to the following institutions: Gray Herbarium, New England Botanical Club, University of Pennsylvania, Missouri Botanical Garden, Cornell University and Marine Biological Laboratory, Woods Hole, Massachusetts.

In the Fiftieth Anniversary Survey of Penikese already referred to,<sup>1</sup> the writer contributed the list of Spermatophytes collected in 1923. Subsequent visits have resulted in several additions to that list and made possible a more careful analysis of conditions on the island, and, as stated earlier, such evidences of vegetational changes as are thus afforded will be dealt with in a later section.

## TOPOGRAPHY OF THE ELIZABETH ISLANDS

The general topography of the Elizabeth Islands is that of gently undulating morainal hills with a maximum elevation of about 170 feet. All the features characteristic of typical morainal regions are here presented, from the rounded hills and depressions, the latter often occupied by ponds or peaty bogs, to the boulders, some the size of a small house, which are scattered everywhere. Nowhere except along the beaches is there any considerable stretch of flat land: a walk across any of the islands necessitates repeated ascent and descent of the rolling hills.

Along the south sides of the islands, facing Vineyard Sound, the shore tends to be steep and precipitous, often presenting sheer sand and gravel faces nearly a hundred feet high, rising abruptly from a narrow cobble beach. In general the highest land is along this south shore, and the ground slopes away gradually to the opposite side of the islands where there are frequent coves and low brackish swamps or fresh ponds.

The ponds which occur in the hollows in the open, rounded hills are, in some cases, merely small pools which may form desiccated bog-holes or disappear entirely in very dry seasons, or, in other cases, are

<sup>1</sup>The Flora of Penikese, Fifty Years After. Edited by I. F. Lewis. RHODORA, xxvi, 181-195, 211-219, 222-229 (1924).

sufficiently large to have been designated as lakes. The largest of these latter, West End Pond on Naushon, is more than a quarter of a mile in diameter.

The character of the beaches varies from those of the rugged boulder type, liberally bestrewn with huge rounded stones, to those which offer a smooth sandy shelf. The characteristic type lies between these extremes, and we find for the most part a shingle or cobble beach with here and there piles of boulders and flat sandy patches. Dunes of shifting sand are rare and occur extensively only at the east end of Nashawena, and along the north shore of Naushon, west of Kettle Cove.

In those islands which have been deprived of their trees the open barren hills are covered with grasses, or other low growth, while the dry hollows or protected lee slopes harbor dense patches of scrub vegetation, made up mostly of *Myrica caroliniensis* and species of *Gaylussacia* or *Vaccinium*. Occasionally an extensive boggy hollow will be densely wooded, the tops of the trees (*Nyssa sylvatica*, *Quercus velutina*, *Acer rubrum*, etc.) conforming to the height and contour of the surrounding slopes.

The most conspicuous vegetational feature of the islands, aside from the open grassy downs, is the dense growth of rather low beech woods which clothes the greater part of Naushon and smaller areas on some of the other islands. From a distance these woods are seen to fit in closely with the general topography, due, doubtless, to the high wind velocity which would tend to level forest growth to the existing lines of the hills and ridges.

#### CHARACTERISTIC FEATURES OF THE SEPARATE ISLANDS

As the various members of the Elizabeth Islands exhibit some diversity as regards general topographic and vegetational features, and also in the influence which man has exerted upon the latter, a brief description of each of the seven main divisions is here given.

**NONAMESSET.** This island, the easternmost of the chain, is roughly oblong with a length of  $1\frac{1}{4}$  miles and a greatest width of  $\frac{1}{2}$  mile. Its longitudinal axis lies east and west. The eastern three-quarters of Nonamesset is essentially treeless, save for an occasional wooded depression, while the western quarter is heavily clothed with mixed beech and oak woods. The rather sharp line between these two areas, a line which follows, for the most part, an old stone wall, indicates that the



treeless nature of the eastern portion is due to artificial denudation, it probably having been cleared for purposes of agriculture or grazing. Altogether there are about 15 ponds of more or less permanent character on Nonamesset and all but one of these lie in the exposed eastern portion. Munsod Pond, as it appears on the charts, has now become merely an arm of Lackey's Bay and the narrow bar which formerly protected it has been submerged. Nonamesset is connected with Naushon by three bridges which cross the narrow gates or "gutters" separating Monohansett and Buck Islands. The East and West Gutters are open and the rapid current flows through them as through a mill race, but the Middle Gutter is "blind," being closed by the stone wall that forms the bridge.

UNCATENA is a triangular-shaped island about  $\frac{3}{4}$  of a mile long and  $\frac{1}{2}$  a mile wide. It lies to the west of Nonamesset across Hadley Harbor and forms a wedge that juts northward into Buzzards Bay. Uncatena is practically treeless, except for a small natural area in the extreme southern corner, and here again the assumption is that active deforestation has been carried on, for it was from the originally densely wooded nature of Nonamesset and Uncatena that Woods Hole is said to have derived its name. There are about a dozen small fresh water ponds on Uncatena during the course of a moderately rainy summer and a large inland brackish pond drains eastward into Hadley Harbor by a sluice-way which makes of the northeastern part of the island a peninsula. Dry, exposed, undulating grassland characterizes the vegetation of nine-tenths of this island, with an increase of scrubby thicket to the westward. The summer home of Mr. Malcolm Forbes is located on the east side of Uncatena and a large central area is fenced off for grazing. This island connects by a bridge across the Northwest Gutter with Naushon.

NAUSHON is the largest of the Elizabeth Islands. It is  $6\frac{1}{2}$  miles long and averages 1 mile wide, with a width of about  $1\frac{1}{2}$  miles at its widest point. It extends from Hadley Harbor almost due southwest to Robinson's Hole which separates it from Pasque. By far the greater part (perhaps  $\frac{3}{4}$ ) of the surface of Naushon is covered with a dense growth of trees. In some regions, like the area near French Watering Place, these woods present an almost pure stand of beech, in others there is considerable admixture of oak, hickory, hop hornbeam, maple and black gum. Almost the only portions of Naushon which are not wooded are those right along the shore or some of

the higher exposed ridges in the central part of the island. Along the north shore, on one of these treeless stretches, Scotch Broom (*Cytisus scoparius*) was introduced some years ago and has taken hold so vigorously that it now solidly occupies an area of several acres. In similar spots along this same shore, various conifers (notably larch, Scotch pine and several spruces) have been set out as a windbreak and these appear to be no more than holding their own. Naushon has many ponds, nearly all of them fresh. West End Pond, Mary's Lake and French Watering Place are the three largest, in the order named, and there are about a score of smaller ones, depending upon the degree of rainfall. The island is indented by two large coves, Tarpaulin Cove and Kettle Cove, which are nearly across from each other on opposite shores. It has been suggested that it was by the approximation of similar indentations that Nashawena was separated from Pasque in comparatively recent times and that the same process may be going on here in Naushon. The gravel cliffs which in many places form the south shore of the island are high and very precipitous. East of Tarpaulin Cove they are usually barren on their crests, while westward they are frequently wooded right to the very edge. Naushon presents several areas of low brackish marshland, the most extensive being near Job's Neck and at the west end near West End Pond. At the east end of the island are the several residences of members of the Forbes family. Here, also are tracts under cultivation and scattered farmhouses and outhouses.

PASQUE. Lying across Robinsons Hole from Naushon is the island of Pasque, or Peskinese, as it was formerly called. Pasque is roughly oval in form, with a long axis, lying east and west, of  $1\frac{1}{2}$  miles, and a short one about 1 mile. It is almost entirely destitute of trees, save for a few protected hollows. The extreme eastern end is low and marshy, and is drained by a sinuous tidal stream. Numerous fresh water ponds are scattered around the rim of the island, for the central part is high and arid. As on the other islands, the depressions among the hills near the shore are often peaty and boggy and several extensive areas of this sort are to be found here. Pasque was formerly the property of a fishing club. As evidences of this are a large frame club-house, a landing wharf, a truck patch and outhouses, including an ice-house on the edge of a small pond; all at the eastern end of the island. The ownership of Pasque has just recently passed into private hands. Between Pasque and Nashawena lies Quicks Hole.

NASHAWENA. The second largest island of the group is Nashawena (formerly Nashuina), or "Little Naushon," with a length of 3 miles and an average width of about a mile. Nashawena contains large wooded areas, chiefly toward the east end, although in the troughs between the long ridges of hills that traverse the island longitudinally trees may be found, except in the western quarter. The shores and the extreme western portion are barren and open, as are likewise the higher hills throughout. Behind the line of dune hills, which forms most of the eastern border of the island, lie two large ponds of fresh water separated by a low swampy area: these are known as "the dune ponds." The easternmost of these ponds is separated from the sound by a low barrier beach, and evidence indicates that inundations of salt water probably occur occasionally during the severe storms of winter. It seems also likely that these two ponds have from time to time been connected as a single body of water. Here again, as on Naushon, the highest land is along the southern side of the island and the slope is to the north. Many of the hollows, especially around the margin of the island, harbor small ponds, and in addition to the dune ponds there are several good sized bodies of water, the largest of which is Choptauk Lake, two-thirds of the way to the west end. There are numerous swampy and boggy areas on Nashawena, most of them occurring in the central parts of the island in the wide depressions between the lines of hills. In many cases these swampy hollows are overgrown by tangles and thickets so dense as to be well nigh impenetrable. It is supposed that, at one time, much of the open land on Nashawena was under cultivation. The old stone farm house, said to have been built in 1725, still stands, although a modern wing has been added to it in recent years. An obscure gravestone bears the date 1736. Today the island belongs to the Forbes family and is used chiefly for the raising of sheep, of which there are thought to be about 700. The caretaker and his wife, Captain and Mrs. Mark Jamison, occupy the new wing of the old farmhouse, and to their kind hospitality the writer owes a very enjoyable and botanically profitable visit to the island in July, 1928.

CUTTYHUNK. West of Nashawena, and separated from it by a very narrow passage, Canapitsit Channel, lies the island which Gosnold in 1602 named Elizabeth's Isle but which has reverted, with some modification, to the old Indian name of Cuttyhunk. Roughly oblong in shape, the main body of Cuttyhunk is some 2 miles long, with a



greatest width of about  $\frac{3}{4}$  of a mile, and lies along a NE-SW axis. From its southeastern corner a narrow sand-spit runs due east for  $\frac{3}{4}$  of a mile toward Nashawena. On this strip is located U. S. Coast Guard Station No. 50. The northeastern quarter of the island is occupied by a large body of salt water known as Cuttyhunk Pond. To the east this is dredged to Cuttyhunk Harbor and thus offers a land-locked refuge to small vessels. West of Cuttyhunk Pond is the little village of Gosnold, spread out upon the sheltered east-facing slope which leads down toward the wharf. All of the central and western portions of the island are open grassy downs, exposed to the full blast of winds from the Atlantic. From the lookout station on the highest hill, near the center of the island, the land slopes gently away to the south and southwest. The low-lying western part of the island is occupied by two bodies of water. One of these is fresh and furnishes the supply of ice for the inhabitants; it has long been known to visiting botanists as Ice-house Pond or Sheep Pond. The other is the pond made known to fame by Gosnold and is variously termed Gosnold Pond or West End Pond. Although originally mentioned as a fresh-water pond, and still referred to as such, this body of water, which is separated from the open sea by a very narrow cobble barrier beach, is certainly frequently inundated. In 1927, *Potamogeton bupleuroides* and *Ruppia maritima*, var. *longipes*, both reliable indicators of a brackish medium, were found growing in it and in 1928 various species of marine algae were collected along its northern shores. Toward the western end of this pond is the tiny island upon which stands the monument to Gosnold already mentioned, an unpretentious structure of rough native stone. Not far from this, but on the extreme western edge of the main island, stands the Cuttyhunk lighthouse. Several smaller ponds and numerous boggy hollows, some of them rather extensive, are scattered over the western and southern portion of the island, but these tend to disappear late in summer when the rainfall is less abundant.

**PENIKESE.** The smallest of the main divisions of the Elizabeth Islands lies a mile to the north of Cuttyhunk. Known also to Gosnold as a cedar covered isle, and called by him Hills Hope, this island likewise goes today by its Indian name and is, if possible, even more barren and treeless than Cuttyhunk. Penikese is about  $\frac{2}{3}$  of a mile long and  $\frac{1}{2}$  a mile wide, with a broadly spatulate peninsula running eastward for  $\frac{1}{4}$  mile from its northern end. Its contour resembles

that of the other islands, the highest point, however, being only about 70 feet. Its few trees are mostly the result of an attempt at a planting made around the building which, in the days of the leper colony, served as the home of the resident physician, although several scrub willows grow in one of the hollows around the margin of a small pond on the east side. Of the former luxuriant forest growth Dr. Jordan, writing in 1874, says, "there is now no trace left save the rotten roots of a solitary beech stump and a few branches of red cedar and red maple (?) found buried in the muck of a small swamp." The status of the ponds on Penikese appears to be even more precarious than of those on the other islands. In favorable seasons six small ponds, two of them brackish, may be found; during a dry summer the number has been known to be reduced to half. Penikese, then, is dominated by open, grassy downs with the exception of the narrow cobbly strip which connects the two portions of the island. That part of the open hillsides forming the northern slope of the island has been taken over by the terns (common and roseate), thousands of which here find their breeding ground. In fact, now that the island has reverted to its wilder state, these birds show a tendency to usurp it altogether. It is extremely difficult to walk across any of the grassland areas during the nesting season without stepping upon the eggs or the young birds. The handsome stone residence building, on the east side near the landing, has been partly demolished, leaving only a portion of the structure to house the caretaker who is still stationed there. The frame cottages on the west side of the island, formerly occupied by the unfortunate lepers, were destroyed in 1927, a single concrete structure being all that remains. This, and the tiny graveyard at the extreme north end of the island, bear mute testimony to the use to which Penikese was put from 1905 to 1921. The remains of an old wooden reservoir cap the highest hill on the island, while, set in a large boulder near by, is a bronze tablet placed there in 1923 to commemorate the fiftieth anniversary of the founding of the Anderson School of Natural History by Jean Louis Rodolphe Agassiz in 1873.

*(To be continued)*

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AN INTERESTING FORM OF *EUPATORIUM PERFOLIATUM*.—While collecting with Mr. C. H. Knowlton in Westport, Massachusetts, on the field-trip of the New England Botanical Club, September 28, 1929,

the writer came across a clump of *Eupatorium perfoliatum* L. which looked rather unusual. The leaves were truncate toward the base as in forma *truncatum* (Muhl.) Fassett and the upper were not perfoliate, but they were much more strongly serrate than usual in that variety or the typical form, being almost laciniate. Near by were clumps showing transition to the typical form, both in the serration and the perfoliate character of the leaves. This peculiar form may be described as follows:

EUPATORIUM PERFOLIATUM L. forma **laciniatum**, n. f., foliis truncatis, non perfoliatis, laciniato-serratis; serraturis 4–9 mm. longis. TYPE in New England Botanical Club Herbarium, from damp thicket near West Branch of Westport River, Westport, MASSACHUSETTS, C. H. Knowlton & G. L. Stebbins, Jr., no. 658.—G. L. STEBBINS, JR., Harvard University.

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SCIRPUS PECKII IN MAINE.—While botanizing about Songo Pond in the town of Albany, Maine, one day last summer I had the good fortune to find a plant of what Professor Fernald later identified as *Scirpus Peckii* Britt., noting that it is "The first authentic collection from Maine." The plant was growing in company with *S. georgianus* Harper on the border of a bog.

On the sandy shore and in the shallow water at the north end of this same pond was a great abundance of *Utricularia cornuta* Michx. and associated with it was the rarer *U. resupinata* B. D. Greene.

Other plants of special interest in or around the pond were *Sarracenia purpurea* L., *Pontederia cordata* L., *Pogonia ophioglossoides* (L.) Ker., *Lycopodium inundatum* L., *Sagittaria latifolia* Willd., forma *gracilis* (Pursh) Robinson, *Cephalanthus occidentalis* L. and *Ranunculus Flammula* L., var. *reptans* (L.) Mey.—LESTON A. WHEELER, Bethel, Maine.

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## FERNS OF THE RED RIVER COUNTRY, MAINE

JOSEPHINE F. CLARK

IN the Red River country, in the northern part of Aroostook County, Maine, not far from the Canadian border, is a comfortable log cabin on a small pine-crowned island in Island Pond. This is headquarters for three city folk who once a year, about the middle of August, after an all day tramp through the forest, emerge upon the shore, and once more feast their eyes on the sight of that cabin and



the pines and the half mile of pond, and rejoice in the thought of weeks of joyous freedom there.

The Red River country lies on high land, in which rise some of the tributary waters of the St. John, the Aroostook, the Allegash and the Fish Rivers. Red River itself is not large. It flows out of Poissoniere Pond into Fish River, about twenty miles below. This high land of many hills and a few real mountains, of which Mt. de Bouillé (2,800 ft.) is the highest, is a region of forest and many spring-fed lakes, ponds and streams. Geologically the rock formation is much disturbed.

Not far from camp is a small oval clearing about 200 yards long, gay with flowers; the large everlasting, black eyed susans, daisies, clover, galium and golden rod. The clearing was made about twelve years ago by an early camper, who grew hay there for his horses. Since his departure seven years ago, the forest has been encroaching on the little clearing once more, and the advance guard of young balsams threatens to obliterate it entirely.

It slopes gently down toward Upper Pond, a most lovely spot, where always we linger. Growing thickly at either side of the trail, pushing up through the sparse grass, grow *Botrychium ternatum* var. *rutaefolium* (A. Br.) DC., and among them, though much fewer in number, are *Botrychium matricariaefolium* A. Br., about fifty or sixty plants.

But that is not all! At the upper end of the clearing we found a few plants of a third *Botrychium*, which my amateur study of fern books classed as *B. lanceolatum*, var. *angustisegmentum* Pease & Moore. However later, showing it to Mr. C. A. Weatherby, of the Gray Herbarium at Cambridge, he pronounced it to be, not the above form usually found in the United States, but the typical European form, *B. lanceolatum* (Gmel.) Angstrom, found rarely in boreal North America, and not previously recorded from the eastern United States.

I also found in this same region on at least eight rocky cliffs, usually with a northern exposure, *Thelypteris fragrans* var. *Hookeriana* Fernald. On one shady irregular perpendicular cliff, 150 to 200 ft. in height, extending for about half a mile, there were certainly 200 plants, some being magnificent specimens. Their favorite place of growth was on a small shelf with an overhang of rock above them, and always they were found high up, above most other ferns. At a certain line of altitude all along a cliff, *T. fragrans* began to appear.

In August, 1928, I found on this cliff a delicate little fern that I couldn't place at all, and on showing my two unfruited specimens to Mr. Weatherby, he too was puzzled by them, and kept them for further study. He decided that they were stunted, starved specimens of *T. fragrans* var. *Hookeriana* Fernald, but lacking many of the characteristics of the normal form. They were from 2 to 5 in. in height, thin and fragile, lacking in chaffiness, but having minute glands. In August, 1929, I was able to collect a series of the above, definitely connecting the small starved form with the normal.

On some of the same rocky cliffs, but at a lower level, grew *Woodsia glabella* R. Br. There were not many of them, and they were mostly rather small not very vigorous plants. One plant beside a mossy trickle of water in a slight break in the wall of rock, grew strong and lusty, standing out from the others. Prof. M. L. Fernald suggested that some lime might have been brought down to it from above by the moisture. *Woodsia glabella* has been collected at least twice before in Maine; but for *W. alpina* (Bolton) S. F. Gray, of which I found a few on these same cliffs, this is the first station in the state. Prof. Fernald had found *W. alpina* growing along the Aroostook River in New Brunswick, but search west of the line was unsuccessful.

*Woodsia ilvensis* (L.) R. Br. grew plentifully on almost all the cliffs with varying characteristics according to the amount of shade or sunshine in which they grew.

There has been heretofore no collecting done in this Red River region, so that forms found there have a special interest. Beside the rarer ferns mentioned there was a wealth of others.

The following is a complete list of the ferns I have already found in the Red River Country of Northern Maine:—

POLYPODIUM VIRGINIANUM L.	THELYPTERIS NOVEBORACENSIS (L.)
PTERIDIUM LATIUSCULUM (Desv.)	Nieuwl.
Hieron.	THELYPTERIS SPINULOSA, var.
THELYPTERIS PHEGopteris (L.)	INTERMEDIA (Muhl.) Nieuwl.
Slosson.	THELYPTERIS SPINULOSA, var.
THELYPTERIS DRYopteris (L.)	AMERICANA (Fisch.) Weath.
Slosson.	THELYPTERIS PALUSTRIS Schott,
THELYPTERIS CRISTATA, var.	var. PUBESCENS (Lawson)
CLINTONIANA (D. C. Eaton)	Fernald.
Weath.	ATHYRIUM ANGUSTUM (Willd.)
THELYPTERIS FRAGRANS, var.	Presl.
HOOKEIANA Fernald.	ATHYRIUM THELYPTEROIDES
THELYPTERIS MARGINALIS (L.)	Michx.
Nieuwl.	

POLYSTICHUM ACROSTICHOIDES  
(Michx.) Schott.

POLYSTICHUM BRAUNII (Spencer)  
Fée, var. PURSHII Fernald.

CYSTOPTERIS BULBIFERA (L.)  
Bernh.

CYSTOPTERIS FRAGILIS (L.) Bernh.

WOODSIA ILVENSIS (L.) R. Br.

WOODSIA ALPINA (Bolton) S. F.  
Gray.

WOODSIA GLABELLA R. Br.

ONOCLEA SENSIBILIS L.

PTERETIS NODULOSA (Michx.)  
Nieuwl.

OSMUNDA REGALIS, var. SPECTA-  
BILIS (Willd.) Gray.

OSMUNDA CLAYTONIANA L.

OSMUNDA CINNAMOMEA L.

BOTRYCHIUM LANCEOLATUM  
(Gmel.) Angstroem.

BOTRYCHIUM MATRICARIAEFOLIUM  
A. Br. (*B. ramosum* (Roth)  
Aschers.)

BOTRYCHIUM TERNATUM, var.  
RUTAEFOLIUM (A. Br.) D. C.  
Eaton

BOTRYCHIUM VIRGINIANUM (L.)  
Sw.

BOSTON, MASS.

## THE NAMES *ASTER ERICOIDES* AND *A. MULTIFLORUS*

S. F. BLAKE

WHEN publishing<sup>1</sup> recently two new varietal names under *Aster multiflorus* Ait., I overlooked a paper by Mr. K. K. Mackenzie<sup>2</sup> in which he showed that the name *Aster ericoides* L., long universally used in another sense, should be taken up for *A. multiflorus*. The name *Aster ericoides* was based by Linnaeus on two references, Gronovius' "*Aster caule paniculato, pedunculis racemosis, pedicellis foliosis, foliis linearibus integerrimis*," and Dillenius' "*Aster ericoides, dumosus*." The specimens on which these names were founded were long ago identified by Dr. Gray<sup>3</sup> as *A. multiflorus* Ait. The specimen from the Upsala Garden labeled *ericoides* in the Linnaean Herbarium, which represents a garden state of the *A. ericoides* of authors, was not in the Linnaean Herbarium in 1753 (about which Dr. Gray was uncertain), and consequently does not figure in the identification of *A. ericoides* as originally described. The current misapplication of the name *A. ericoides* originated with Aiton<sup>4</sup> in 1789. Aiton's misinterpretation has been followed by nearly all subsequent authors, although Michaux (1803) and Schkuhr (1803), as cited by Gray in 1884, used this name for plants not more than varietally separable from the original *A. ericoides* L. Gray himself stated that the name

<sup>1</sup> RHODORA 30: 227-228. 1928.

<sup>2</sup> RHODORA 28: 65. 1926.

<sup>3</sup> Proc. Amer. Acad. 17: 165. 1882.

<sup>4</sup> Hort. Kew. 3: 202. 1789.



*A. ericoides* should have been continued by Solander<sup>1</sup> for the Dillenian and Gronovian plant, "unless he could ascertain that the specimen in the Upsal Garden was in the herbarium as early as the year 1753." Instead of making this needful correction, Gray chose to continue the usage established by Aiton, in which he has been followed by all American authors until the publication of Mr. Mackenzie's note.

In view of the fact that several varieties of *Aster multiflorus* have been described since Dr. Gray examined the plants forming the foundation of Linnaeus's description, it has seemed wise to obtain more definite information about certain specimens in European herbaria. Clayton 194, in the British Museum, the basis of Gronovius' "*Aster caule paniculato, pedunculis racemosis, pedicellis foliosis, foliis linearibus integerrimis*,"<sup>2</sup> has been examined by Mr. George Taylor, who informs me that the hairs on the upper part of the stem are appressed, but not closely so, and that the pubescence on the lower part varies considerably, some of the hairs being spreading. It is evident from his notes that the plant is to be placed under typical *A. multiflorus* and not under the variety which has wide-spreading pubescence throughout. Mr. G. Claridge Druce reports that the stem pubescence is appressed in the Dillenian specimen which is the basis of his "*Aster ericoides, dumosus*."<sup>3</sup> An excellent photograph of the type specimen of *Aster villosus* Michx. in the Michaux Herbarium, taken for me by Mr. A. Cintract with the permission of Prof. H. Lecomte, is available. The type consists of only the upper part of the plant, but the comparatively large and broad involucre, the conspicuous spreading pubescence of the stem, and the very narrowly linear stem leaves leave no room for doubt that the name is properly identified in Torrey and Gray's Flora and in Gray's Manual with that phase of "*ericoides*" which differs from the typical form of that species (as usually understood) only in the presence of copious pubescence. The two type sheets of *Aster multiflorus* var. *caeruleus* Benke, in the Field Museum of Natural History, have also been examined through the kindness of Mr. Paul C. Standley. In these the pubescence of stem and branches is ascending or subappressed; the rays, as noted by the collector, were blue with a suggestion of purple. I cannot separate them from the western plant described by Piper as *A. columbianus*, the rays of which were described as violet.

<sup>1</sup> As to the part taken by Solander and Dryander in the preparation of Aiton's "Hortus Kewensis" see J. Britten, Journ. Bot. 50: Suppl. 3. 1912.

<sup>2</sup> Gron. Fl. Virg. 100. 1739; ed. 2. 124. 1762.

<sup>3</sup> Hort. Elth. 40. pl. 36, f. 40. 1732.

The name *Aster ericoides* L. being necessarily transferred to the plant generally known as *A. multiflorus* Ait., it remains to find a name for the *A. ericoides* of our manuals and floras. The earliest specific name applied to any form of "*A. ericoides*" of authors is evidently *Aster villosus* Michx. (1803), a name unfortunately pre-occupied by *A. villosus* Thunb. (1800). The latter name is referred to the synonymy of *Felicia angustifolia* in the Index Kewensis, evidently on the basis of De Candolle's placing of it in the synonymy of *Felicia angustifolia*  $\alpha$ . *hyssopifolia* (Berg.) DC.<sup>1</sup> Nees' *Felicia angustifolia* (1832) was based on "*Aster angustifolius* Willd. Sp. pl. III. 3. p. 2017. n. 12. ex parte" (1803), a name which depends on *Aster angustifolius* Jacq. (1798). In Harvey's treatment of the Compositae in the Flora Capensis (3: 71, 73, 75. 1864) the genus *Felicia* is sunk in *Aster*, and *A. angustifolius* Jacq. and *A. hyssopifolius* Berg. are treated as distinct, the name *A. villosus* Thunb. not being mentioned even in synonymy. Willdenow<sup>2</sup> retained *Aster villosus* Thunb. as a valid species of *Aster* and gave the new name *A. pilosus* to *A. villosus* of Michaux. Under the American Code Willdenow's name must be retained, and the same course would seem necessary under the International Rules, since, in view of the lack of agreement regarding the status of the genus *Felicia* and the uncertainty regarding the identity of *Aster villosus* Thunb., the latter name can scarcely be considered to be "universally regarded as non-valid."<sup>3</sup> The names to be used for the species which have been called *A. ericoides* and *A. multiflorus*, and their varieties, are the following:

ASTER ERICOIDES L. Sp. Pl. 2: 875. 1753. *Aster multiflorus* Ait. Hort. Kew. 3: 203. 1789. *Aster multiflorus*  $\beta$ . *stricticaulis* Torr. & Gray, Fl. N. Amer. 2: 125. 1841. *Aster multiflorus* var. *exiguus* Fernald, RHODORA 1: 187. 1899. *Aster exiguus* Rydb. Bull. Torrey Club 28: 505. 1901, as to name-bringing syn. only. *Aster stricticaulis* Rydb. Fl. Rocky Mount. 885, 1067. 1917.

This plant, the *Aster multiflorus* of practically all authors for more than a century, must be called *Aster ericoides* L.

A. ERICOIDES var. **prostratus** (Kuntze). *Aster multiflorus*  $\beta$  *prostratus* Kuntze, Rev. Gen. Pl. 1: 313. 1891. *Aster multiflorus* var. *pansus* Blake, RHODORA 30: 227. 1928.

<sup>1</sup> Prodr. 5: 220. 1836.

<sup>2</sup> Sp. Pl. 3: 2017, 2025. 1803.

<sup>3</sup> Under the modified interpretation of Art. 50 of the International Rules recently proposed by Briquet and by Sprague, it would be necessary in any case to reject the name *Aster villosus* Michx., since the earlier homonym of Thunberg was proposed as a new species.

Distinguished by its wide-spreading pubescence, that of the typical form being appressed or merely ascending. Kuntze's *A. multiflorus*  $\beta$  *prostratus* was defined in the following words: "caulis prostratus ramis erectis," being contrasted with his  $\alpha$  *normalis*, of which he says "caulis erectus." Examination of the type (Nebraska, Sept. 1874, *Kuntze*), kindly lent by Dr. J. K. Small from the herbarium of the New York Botanical Garden, shows that it is the form with spreading pubescence. Dr. J. K. Small writes me that no named material of  $\alpha$  *normalis* is in Kuntze's herbarium. The habitual differences on which Kuntze relied in separating his two varieties are obviously of no importance. *Aster hebecladus* DC. Prodr. 5: 242. 1836, and *A. scoparius* DC. (not Nees, 1818), l. c., are very closely related forms from the arid southwestern United States, which may require reductions to synonymy under var. *prostratus*.

A. ERICOIDES f. **caeruleus** (Benke). *Aster columbianus* Piper, Contr. U. S. Nat. Herb. 16: 210. 1913. *Aster multiflorus* var. *caeruleus* Benke, RHODORA 30: 78. 1928. *Aster multiflorus* var. *columbianus* Blake, RHODORA 30: 227. 1928.

This plant, distinguished from the typical form of *A. ericoides* only by the blue or violet color of its rays, is better treated as a forma than a variety.

ASTER PILOSUS Willd. Sp. Pl. 3: 2025. 1803. *Aster villosus* Michx. Fl. Bor. Amer. 2: 113. 1803 (Not *A. villosus* Thunb. 1800). *Aster ericoides*  $\beta$ . *villosus* Torr. & Gray, Fl. N. Amer. 2: 124. 1841. *Aster ericoides pilosus* Porter, Mem. Torrey Club 5: 323. 1894.

This is *Aster ericoides* var. *villosus* of recent authors.

A. PILOSUS var. **platyphyllus** (Torr. & Gray). *Aster ericoides*  $\gamma$ . *platyphyllus* Torr. & Gray, Fl. N. Amer. 2: 124. 1841.

A. PILOSUS var. **demotus**, var. nov. *Aster ericoides* Ait. Hort. Kew. 3: 203. 1789, not L. (err. ident.). ?*Aster glabellus* Nees, Syn. Aster. 31. 1818.—Plant glabrous or very sparsely pilose; leaves narrow; heads numerous, paniced, the panicle branches more or less racemiform. TYPE no. 356711, U. S. National Herbarium, collected near Virginia Beach, Princess Anne County, Virginia, 1 Oct. 1898, by T. H. Kearney (no. 2059).—Maine and Ontario to North Carolina and Missouri, common.

This is *A. ericoides* of practically all authors since Aiton, except Michaux (Fl. Bor. Amer. 2: 113. 1803), and Schkuhr (Bot. Handb. 105. pl. 245. 1803), both of whom used the name *A. ericoides* in essentially its Linnaean sense—that is, for some form of *A. multiflorus* Ait. Although *Aster glabellus* Nees (a name wrongly attributed by



its author to Michaux) is referred by Gray to the synonymy of *A. ericoides*, the description is not entirely convincing, and the name is best passed over. Specimens of the present form with stems absolutely glabrous are difficult to find. The name *pilosus* should be restricted to those plants in which the stem is conspicuously hairy, and the subglabrous plants referred to var. *demotus*.

A. PILOSUS var. **pringlei** (Gray). *Aster ericoides* var. *pringlei* Gray, Syn. Fl. 1<sup>2</sup>: 184. 1884. *Aster pringlei* (Gray, Proc. Amer. Acad. 16: 99. 1880, nomen nudum); Britton in Britton & Brown, Ill. Fl. 3: 379. 1898.

A. PILOSUS var. **reevesii** (Gray). *Aster ericoides* var. *reevesii* Gray, Syn. Fl. 1<sup>2</sup>: 184. 1884. *Aster reevesii* Hort.; Gray, l. c. as synonym. 1884.

An ambiguous form. *Aster priceae* Britton, Man. 960. 1901, and *A. kentuckiensis* Britton, l. c., are closely related and when better known may prove to be synonymous with this variety or recognizable as independent varieties.

BUREAU OF PLANT INDUSTRY,  
Washington, D. C.

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## CUBELIUM CONCOLOR

EDWIN H. EAMES

So little has been written concerning *Cubelium concolor* (Forst.) Raf. that it seems worth while to note some observations in relation to it.

The type was described as having stems hispid throughout, was in cultivation and of North American origin. Such hispid plants occur here and there nearly throughout the range of the species, but usually are glabrous below and in varying degree to the summit. The hairs are of several kinds, all segmented. Those strictly hispid sometimes occur alone and rather sparsely. Commonly these are more or less obscured by mixture with glistening white, flattened, irregular hairs which, when abundant, give a coarse, somewhat woolly appearance to the stem. Among the latter may be some spiral hairs and some with the planes of the flattened segments at diametrical right angles, the terminal one ensiform.

There is every degree of lesser hairiness to that in which it is reduced to narrow lines toward the summit of the stem, a scant pubescence, or

entire glabrousness. These characters and more are easily seen with a hand-lens.

The plant is at least locally common in the Central States and has long been known eastward to central New York and the Delaware valley. Further east but three stations appear in the records: New York: "Lebanon," Columbia Co., *L. C. Beck*,<sup>1</sup> near the Massachusetts State line west of Pittsfield; Pine Plains, Dutchess Co., *L. H. Hoysradt*,<sup>2</sup> about eight miles from the Connecticut State line, where, "in a cold mountainous woods" on Mt. Ararat, "it was growing luxuriantly—many of the stems being all of three feet in height—and covered several acres . . . almost to the entire exclusion of other herbaceous plants"; Tarrytown, Westchester Co., 1864, *I. H. Hall*,<sup>3</sup> five miles from the Connecticut State line.

On May 17, 1929, I found a long-established colony of it in the Housatonic valley at Southbury, New Haven County, Connecticut, the flowers immature, and, excepting cilia on leaves and stipules, the plants essentially leavigate throughout. It grew often in clumps of 10–30 stems, with smaller groups and a few solitary stems skirting the colony. Later collections had slight pubescence, mostly in narrow lines, while some clumps had stems sparsely hispidulous toward the summit, thus approaching the type, but the flowers and capsules were too small to fit descriptions.

Fresh flowers never exceeded 6 mm. long; most of them were 5–5.5 mm., or when dried 4–5 mm. The capsules rarely exceeded 15 mm. in length, with a diameter of 12–13 mm. Other similar specimens in herbaria have capsules normal for the species, at least to 21 mm. long. Western specimens of the species often have flowers about 1 mm. longer.

This nearly or quite glabrous phase of the species, being extreme and easily recognizable, was distributed by me to several herbaria under a manuscript varietal name. While its status may be a matter of point of view, it is here proposed as

*CUBELIUM CONCOLOR* (Forst.) Raf., f. *subglabrum*, f. nov., caulibus omnino glabris, vel lineis angustis leviter pubescentibus ornatis, vel superne sparsissime hispidulis.

Stems glabrous throughout, to slightly pubescent in narrow lines, or very sparsely hispidulous at the top.—Southern Ontario to Con-

<sup>1</sup> Botany of the Northern and Middle States, 42. 1833.

<sup>2</sup> Bull. Torr. Bot. Club 5: 37, 47. 1874.

<sup>3</sup> Bull. Torr. Bot. Club 1: 6. 1870.

necticut and Alabama. ONTARIO: London, 1881, *Burgess*. NEW YORK: Collins, Erie Co., *Anne E. Perkins*, no. 75,316 in part. Various stations in the central part of the State. CONNECTICUT: in pockets of rich soil among coarse blocks of talus near base of wooded slope, Southbury, New Haven Co., June 2, July 7, 1929, *E. H. Eames*, no. 10,876. NEW JERSEY: Hunterdon Co., *H. W. Pretz*, no. 2964. PENNSYLVANIA: Lehigh Co., Bethlehem, 1869, *A. F. K. Krout*; near Allentown, *Krout, Pretz*, no. 2489; along Jordan Creek, *Pretz*, no. 8457 some large colonies for several miles, partly in lime-stone soils and talus. Apparently rare at various points to GEORGIA: bank of Savannah River, Germain's Island, Columbia Co., *R. M. Harper*, no. 1297 (TYPE in Gray Herb.); Rome, Hb. *A. W. Chapman*. ALABAMA: without locality, May, 1841, *S. B. Buckley*, no. 1; Clay Co., 1897, *F. S. Earle*. TENNESSEE: *S. B. Buckley*; Knoxville, 1898, *A. Ruth*, in part.

In some localities plants typical of both the species and the form have been collected and distributed with the same data. In both the capsules have the sides parallel toward the apex which is rather squarely obtuse, due to abrupt incurving of the valves to the depressed style-base. Rhizomes are distorted, knotted, very hard, often massed. Main roots are cord-like with rootlets whitish, irregularly much branched and interlaced, of nearly constant size, and forming bulky masses sometimes 35 cm. long. Some clumps growing in leaf-mold topping cavernous spaces had the lower rootlets suspended, with the soil merely adherent.

Young stems are succulent, brittle, while dead ones of the preceding year lying about commonly show some wind-whipped fibres in coarsely fibrous gray integument. A little search in the litter may reveal buff-colored, wide-spreading open capsules or valves.

Throughout its range the species shows a preference for well-drained slopes, especially near the base of wooded talus which is very often limestone or containing lime, and occurs in colonies often extensive. Noteworthy specimens include one from "Hot Springs, Little Rock" Hb. *George Engelmann*, Sept., 1835, growing in "saline" conditions, having a stem 40 cm. tall and two leafy branches 18 and 19 cm. long; and one plant of the form in flower, Rome, Georgia, Hb. *A. W. Chapman*, with the stem 24 cm. long and leaves about 12 by 40 mm.

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